

A SYSTEMATIC REVIEW OF *UROMACER CATESBYI* SCHLEGEL
(SERPENTES, COLUBRIDAE)

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ABSTRACT

Uromacer catesbyi occurs throughout Hispaniola and on seven satellite islands. The species is polytypic and the following subspecies are recognized: *U. c. catesbyi* (Tiburon Peninsula, Haiti, west of Momanche), *U. c. cercolineatus* (Isles Petite and Grande Cayemite, Haiti), *U. c. frondicolor* (Ile de la Gonave, Haiti), *U. c. hariolatus* (Haiti, north of the Cul de Sac Plain), *U. c. inchausteguii* (Isla Saona, República Dominicana), *U. c. insularvacarum* (Ile-à-Vache, Haiti), *U. c. pampineus* (República Dominicana, north of the Valle de Neiba), and *U. c. scandax* (Ile de la Tortue, Haiti). Populations inhabiting the Cul de Sac-Valle de Neiba and the Peninsula de Barahona are assigned intergrade status between *catesbyi*, *hariolatus*, and *pampineus*. The subspecies have differentiated in pattern details and in ventral and subcaudal scale counts. Prototype *catesbyi* presumably divided early into north and south islands populations, the latter with a bold longitudinal line on the lower scale rows. Further differentiation proceeded from these bases; satellite forms are associated with the subspecies on the adjacent mainland.

The colubrid snake genus *Uromacer* Duméril and Bibron is one of four endemic colubrid genera on the Antillean island of Hispaniola. Cochran (1941:329 *et seq.*) recognized six species in the genus: *catesbyi* Schlegel, 1837; *scandax* Dunn, 1920; *frenatus* Günther, 1865; *wetmorei* Cochran, 1931; *dorsalis* Dunn, 1920; and *oxyrhynebus* Duméril and Bibron, 1854. These six species are separable into two groups: one group (*catesbyi*, *scandax*) has the head only slightly elongate with but little modification in the

shape of the preorbital scutellation, whereas the other (the remaining four taxa) has the head very much attenuate, in the fashion of the better known New World mainland genus *Oxybelis*. Of the six forms recognized by Cochran, three (*scandax*, *wetmorei*, *dorsalis*) were considered to be endemic to Hispaniolan satellite islands (Ile de la Tortue, Isla Beata, Ile de la Gonave, respectively). All *Uromacer* are either green, gray, tan, or some combination of these three basic hues. The long-snouted forms are "vine snakes" in that they are adept climbers and sleep above ground at the tips of branches, whereas the short-snouted forms are apparently somewhat more terrestrial in their activity (but see comments on diet and sites of foraging by Horn, 1969).

Evidence from field studies indicates that there are fewer than six species of *Uromacer*. At the time of Cochran's work, many areas of Hispaniola were unrepresented by collections, and these hiatuses in the distribution of members of the genus may have been responsible for Cochran's interpretation of the distinctness of the various taxa. At most, there appear to be three species (Horn, 1969, recognized four); it is the purpose of this paper to discuss the geographic variation in one of these, *U. catesbyi*, to which species I assign both of the short-snouted taxa: *catesbyi* and *scandax*.

I have examined 265 *U. catesbyi* (including *U. scandax*). Considering the amount of herpetological collecting in Hispaniola in recent years, this is a remarkably small number of snakes. There are other specimens

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in collections, notably in the United States National Museum, which I have not studied, since they in general duplicate material examined in other collections. Nevertheless, *U. catesbyi* seems a less abundant (or possibly less easily secured because of its cryptic coloration) species than other members of the genus.

Collections made in 1963 by myself and party in Haiti easily demonstrated that *U. catesbyi* from the Tiburon Peninsula west of Port-au-Prince differed markedly in life from snakes from north of the Cul de Sac Plain. Additional specimens from both Haiti and the República Dominicana taken between 1964 and 1968 not only confirmed these originally observed differences but also demonstrated the existence of other distinct populations on Hispaniola and its satellite islands. Although there are obvious differences in scutellation between these populations, the most prominent traits are pigmental. Data on the coloration of living individuals are invaluable in a study of the variation in *U. catesbyi*.

Specimens collected by myself and various parties are in the Albert Schwartz Field Series (ASFS). Collections from the República Dominicana were made in 1968 under National Science Foundation Grant GB-7977. I wish to acknowledge the field assistance of Patricia H. Adams, Robert K. Bobilin, Sixto J. Incháustegui, Ronald F. Klinikowski, David C. Leber, John K. Lewis, Dennis R. Paulson, James A. Rodgers, Jr., and Richard Thomas, all of whom aided immeasurably in collecting these snakes in Hispaniola. Mr. Thomas deserves special mention for collecting on Ile Grande Cayemite for me, and Mr. Klinikowski and Drs. Leber and Paulson visited Ile-à-Vache on my behalf. The availability of *U. catesbyi* from Isla Saona is due primarily to the cooperation of Sr. Incháustegui, whose assistance in securing transportation to that little-known island cannot be minimized. In addition to specimens in the ASFS, I have studied snakes in the collections of the Carnegie Museum (CM), the American Museum of Natural History (AMNH), the Museum of Comparative Zoology at Harvard University (MCZ), and the United States National Museum (USNM). These snakes were lent to me by Neil D. Richmond and Clarence J. Mc-

Coy, Jr., Richard G. Zweifel and George W. Foley, Ernest E. Williams, and James A. Peters, respectively, all of whom I wish to thank for their cooperation. A single snake in the collection of Lewis D. Ober (LDO) has also been available to me. Holotypes and paratypes of new subspecies have been designated or deposited in the above collections.

I have counted ventral scales in the manner proposed by Dowling (1951). Paired subcaudal scales also have been tabulated, but, as in many long-tailed snakes, a large number of *U. catesbyi* have incomplete tails. Since the tail is extremely attenuate terminally, even the loss of as little as a centimeter from the end of the tail may profoundly affect the subcaudal count. Accordingly, I have counted the subcaudals of only those snakes that still retain the terminal spine. Supra- and infralabials, loreals, pre- and postoculars, and temporals also were counted. Number of dorsal scale rows behind the head, at mid-body, and before the vent were counted, and each snake was measured (both snout-vent length and tail length) in millimeters.

Uromacer catesbyi (*sensu lato*) is widely distributed on the Hispaniolan mainland and has been taken also on Ile de la Tortue, Ile de la Gonâve, Ile Petite and Ile Grande Cayemite, Ile-à-Vache, and Isla Saona. There are no specimens or records of the species from Isla Beata, where one of the long-snouted forms of *Uromacer* occurs, but almost certainly *U. catesbyi* will be taken on that island. Although there are no specimens from Isla Catalina off the southern Dominican coast, in August 1968 I examined a much decayed *U. catesbyi* that had been killed by members of the Catalina naval garrison a few days previously; thus, the snake does occur on that islet.

Uromacer catesbyi is an inhabitant of wooded situations, but the woods need not be extremely mesic nor high. Presence of shade seems to be a predominant factor, and such lowland situations as lime and cacao groves or scrub and cultivated gardens offer sufficient retreats and shelter for these snakes. Most individuals secured by us were found on the ground or in low bushes. A snake was taken at Centro de Boyá in the República Dominicana, however, as it crawled across the surface of a termitarium at a height of five meters in a tree adjacent

to a road in a patch of broadleaf woods; one of a pair of snakes (which were apparently fighting) was secured from a banana tree at Peneau in Haiti. Perhaps the most interesting site for collection of *U. catesbyi* was a stand of deciduous woods that borders a road near Palo Verde in the República Dominicana. The woods were separated from the road by a barbedwire fence and were surrounded by land planted in sugar cane. Five *U. catesbyi* were taken as they traveled along the barbedwire. When alarmed, the snakes glided away rapidly, using the tops of low shrubs adjacent to the fence as an avenue of escape into the woods beyond. Despite our presence, persistent patrolling of the length of fence continued to reveal more snakes, and it seemed certain that even though alarmed the snakes returned rather quickly to lie upon the shaded barbedwire. Anoles were extremely abundant in the woods and on the fence, and I am confident that the snakes, lying extended on the wire along which the anoles scampered, found this method a simple one of securing food. I have not examined stomach contents of *U. catesbyi* but a *Leiocephalus m. melanochlorus* was regurgitated by a snake taken on Ile-à-Vache. Since this lizard regularly climbs (Schwartz, 1966:48), the fact that it serves as a food item for *U. catesbyi* does not necessarily indicate terrestrial foraging on the part of the snake. Mertens (1939:78) reported a species of *Anolis* and *Hyla dominicensis* as food items for this species. Horn (1969:8-9) listed *Hyla pulcherrilineata*, *H. dominicensis*, *Anolis chlorocyanus*, *A. coelestinus*, *A. cybotes*, and *A. distichus* as food items in *U. catesbyi*. He correctly considered these prey animals as inhabiting trees, tree trunks, and bushes, and stated that *U. catesbyi* "takes arboreal food almost exclusively."

Uromacer catesbyi occurs from below sea level (various localities in the vicinity of Etang Saumâtre and Lago Enriquillo in the Cul de Sac-Valle de Neiba plain) to elevations of 5000 feet (1525 meters) at Peneau on the Montagne Noire in Haiti.

The abundance of *U. catesbyi* varies on the satellite islands. This is remarkably demonstrated by contrasting the situation on Ile-à-Vache with that on Ile de la Tortue. On the former, during two 1-day visits with ample native assistance, we secured 59 *U.*

catesbyi. On Tortue, C. Rhea Warren also spent two days, and, despite promises of remuneration for green snakes, the natives brought no *U. catesbyi* and only a very few *U. oxyrhynchus*. Coupled with the fact that only three Tortue *U. catesbyi* are present in collections, the experience suggests that on Tortue the species is quite uncommon. On Isla Saona, natives brought us both *U. catesbyi* and *U. oxyrhynchus*, more of the latter species being represented. Judged only by my experience, on Ile de la Gonâve *U. dorsalis* outnumbers *U. catesbyi*, but on Ile-à-Vache *U. catesbyi* appears to outnumber *U. frenatus*. Reasons for the abundance or rarity of *U. catesbyi* (or its relative abundance to one of the long-snouted forms) on these satellite islands are unknown.

All populations of *U. catesbyi* are some shade of green both dorsally and ventrally, with the ventral color lighter (more yellow or paler green) than the dorsal color. Those populations associated with the Tiburon Peninsula in Haiti (including snakes from Ile-à-Vache and the Cayemites) have a prominent lateral line in life, usually associated with scale rows one to three, which is pale blue, pale greenish, or white. The dorsal scales usually are very finely edged with black, but in the Isla Saona population, the dark scale edging is very bold and gives a distinctly squamate appearance to the dorsum. Additionally, two populations have dark gray-green markings on the dorsal head scales. All these pattern elements are important in distinguishing the constituent subspecies. In all samples except that from Tortue, there are ample numbers of individuals. There are no color data available for specimens in collections other than the ASFS, and even in my own material I do not have sufficient information to show if differences in dorsal green hue are individual or populational variations. In specimens from other collections, it is often difficult to determine whether the pale lateral line was present, since these snakes become readily discolored after improper preservation, and many long-preserved snakes are now black and without any pattern indications. However, it seems reasonable that, if all freshly collected material from a region shows certain pattern features, these features were also present in older material.

Schlegel's (1837:226-227) description of

Dendrophis catesbyi is brief but sufficiently detailed to allow the name to be positively associated with one population of the species. His data (170 ventrals and 184 subcaudals; uniform grass green above, bluish green below, the two colors separated by a whitish line bordered above by black on the sides of the head) show that the specimen before him almost certainly was a female from the Tiburon Peninsula population. Since collection of the snake was attributed to Alexandre Ricord, a Frenchman who likely collected in Haiti (which at that time was the French colony of St.-Domingue) and who most probably collected in the vicinity of one of the prominent settlements such as Port-au-Prince, where snakes with similar scale counts and pattern occur, the application of nominate status to the Tiburon snakes is affirmed.

SYSTEMATIC ACCOUNTS

Uromacer catesbyi Schlegel

D. (endrophis) catesbyi Schlegel, 1837, Essai sur la physionomie des serpents, 2:226. (Type locality—St.-Domingue).

Uromacer catesbyi Duméril and Bibron, 1854, Erpét. gén., 7:721.

Uromacer scandax Dunn, 1920, Proc. New England Zool. Club, 7:43. (Type locality—"Tortuga Island").

Description: A moderately long (males to 718 mm, females to 908 mm snout-vent length) and slim colubrid snake with 17 or 19 (infrequently 21) scale rows behind the head, 17 scale rows at midbody, and 11 scale rows before the vent; 157 to 177 ventral scales in males, 155 to 179 in females; dorsal scales smooth and without apical pits; head scutellation of the normal unspecialized colubrid type, although the snout is slightly elongate, with modally 1/1 loreals, 1/1 preoculars, 2/2 postoculars, and 1 + 2/1 + 2 temporals; supralabials usually 8-8, infra-labials usually 10-10; anal divided; subcaudals paired, 172 to 208 in males, 159 to 201 in females; dorsum green, the individual scales usually not conspicuously outlined with black along their free margins; lower sides with or without a sharply contrasting longitudinal line, white, pale green, or blue, embracing scale rows 1 to 3 or any combination thereof; venter immaculate pale green, this color paler than the dorsum, often ex-

tending dorsally onto the lower two or three dorsal scale rows and, in the absence of a pale longitudinal lateral line, blending into, or sharply set off from, the darker dorsal green color; a dark green to black mask-like line from the snout through the lower half of the eye onto the temporal region, bounded below by the pale supralabial coloration, and extending onto the neck where it rapidly disintegrates; top of head immaculate green, occasionally (by population) with scattered irregular darker green markings or blotches; hemipenis short (extending about the length of 5 or 6 subcaudals), deeply bifid, the sulcus spermaticus bifurcating to send a branch along each of the distal forks of the hemipenis; the sulcus spermaticus traverses an area which is finely papillose or spinose after first coursing across a prominent median basal lobe or ring which is densely set with minute spines; the non-sulcate surface is laterally covered with closely set enlarged spines which stop abruptly at the papillose region bordering the sulcus, and which more medially are sharply set off from a more or less cordate area, its apex directly basally, of minute spines; this cordate area is expanded distally to form almost a pair of apical discs which form the non-sulcate surface of the distal hemipenial forks. (Description based on the everted organs of ASFS V9565 and ASFS V10304).

Uromacer catesbyi catesbyi Schlegel, 1837

Definition: A subspecies of *U. catesbyi* characterized by the combination of very low number of ventral scales (161 to 169 in males, 156 to 172 in females), high number of subcaudal scales (188 to 202 in males, 173 to 190 in females), a prominent sky-blue lateral longitudinal line usually on scale row 2, but often including 1 and 3, upper surface of head immaculate green, and large size.

Distribution: The Tiburon Peninsula in southwestern Haiti, east to about the level of Momance (Figure 1); specimens from Momance eastward through the Cul de Sac-Valle de Neiba plain and the Peninsula de Barahona in the República Dominicana are interpreted as intermediate between the nominate subspecies and subspecies to the north (see discussion beyond).

Variation: A series of 18 male and 29

female *U. c. catesbyi* from the Tiburon Peninsula west of Momance has the following counts (means and extremes); ventral scales in males 161–169 (164.9), in females 156–172 (163.2); subcaudal scales in males 188–201 (194.6), in females 173–190 (182.1); supralabials usually 8, 8 (45 snakes) with 2 snakes having 7, 8, infralabials usually 10–10 (40 snakes) with aberrant counts of 8–8 (1), 9–10 (3), 9–11 (1), and 10/11 (1); loreal scales 1, 1 (ASFS X3059 with 0–0 loreals), preocular scales 1/1 (CM 37788 with 2, 2 preoculars), postocular scales 2–2 (MCZ 70138 with 2, 3 postoculars), temporals 1+2–1+2 (CM 37788, MCZ 70135, ASFS X3213 with 1+1 bilaterally; MCZ 70138, MCZ 64798 with 1+1 unilaterally); largest female (MCZ 65207) with a snout-vent length of 830 mm, largest male (MCZ 70131) 685 mm.

Material from the Port-au-Prince region, where Ricord may have secured the holotype, is intermediate between the nominate subspecies and material from further north; snakes from a short distance west of Port-au-Prince (Momance) clearly resemble those from more distal portions of the peninsula. Even in the Port-au-Prince region, some snakes have the typical pale blue lateral line of *U. c. catesbyi*; this line fades to white in long-preserved snakes and I have little doubt that the holotype possessed this pattern feature while alive. In ventral and subcaudal counts, the holotype agrees with females from both the Tiburon Peninsula (if slight differences in techniques of counting both complements of scales are taken into consideration) and the Port-au-Prince region. It is of course possible that the holotype originated from some more western locality on the peninsula; sites such as Jérémie and Les Cayes have long been prominent seaports for this region. There is little doubt, however, that *U. c. catesbyi* is the proper name for the Tiburon Peninsula snakes.

Specimens from Camp Perrin were dark green (Pl. 22 K 4 to Pl. 24 C 7; all color designations from Maerz and Paul, 1950) in life, with both supra- and infralabials pale green. There was a pale blue (Pl. 25 A 4) longitudinal line of scale row 2, in some specimens including portions of rows 1 and 3, often prominent only anteriorly but in some snakes continuing posteriorly to the vent. The venters (including the chin)

were pale yellow-green (Pl. 17 H 5 to Pl. 17 C 4), this paler coloration extending dorsally onto at least scale row 1, thereby giving a tricolor appearance to the lower sides—dark green, pale blue, and yellow-green, from dorsal to ventral. The iris was gold above and below, and brown anteriorly and posteriorly, thus giving a quadripartite effect; the black mask was outlined above with faintly paler green.

Horn (1969) commented on the occurrence of a gray morph of *U. catesbyi* near Miragoâne. His data were based upon examination of five snakes in the Harvard collection, of which the number of only one (MCZ 66350) was reported. In actuality, there are six *U. catesbyi* in the MCZ collection (25555, 25556, 66349, 66350–51, and 66352) from the Miragoâne region, and another in the Carnegie Museum (CM 37875). I had examined all these specimens prior to the appearance of Horn's paper and considered them in no way different in pigmentation of pattern from other preserved snakes from the Tiburon Peninsula. I have re-examined them in the light of Horn's contention that they were gray above and cream below in life and find that as preserved they are bluish to greenish blue above and pale grayish green below—all colors which occur in preserved *U. catesbyi* from throughout its range. Since green is an especially fugitive color in preservative, and since the precise color of the preserved snake depends upon the original fluid in which it was preserved and the length of time it was stored in the fluid prior to being transferred to the appropriate concentration of alcohol for permanent storage, I do not feel that these snakes (among which must be the four remaining snakes which Horn examined) differed in any strongly chromatic manner from other snakes assigned to *U. c. catesbyi*. The unproved dichromatism in *U. catesbyi* needs further confirmation before it is established.

Scale counts of all subspecies are grouped in Table 1 for ready reference. The various subspecies comparisons are grouped after the subspecies accounts, and this section is in turn followed by a discussion of the probable history of the species on Hispaniola.

Specimens examined: Haiti. Dépt. du Sud, Jérémie, 2 (MCZ 3603); Fond Rouge Daye, nr. Jérémie (not mapped) (MCZ

70128-33); Place Nègre, nr. Jérémie (MCZ 64798-800); Tosia, nr. Jérémie (not mapped) (MCZ 70138); Paroty, nr. Jérémie (not mapped) (MCZ 70137); Mayette, nr. Jérémie (MCZ 70135-36); Lantini, nr. Jérémie (not mapped) (MCZ 70134); Riverdi, nr. Jérémie (not mapped) (MCZ 70127); Trou Bois (MCZ 74521-22); Camp Perrin (ASFS X2976, ASFS X3059-65, ASFS X3153-57, ASFS X3252-53); Petit Trou de Nippes (USNM 80812); nr. Etang Miragoâne (MCZ 25556); *Dépt. de l'Ouest*, Bascap-Rouge, 10 km NE Jacmel (CM 37788-89, MCZ 65207-08); Momance (MCZ 8670); either *Dépt. de l'Ouest*, or *Dépt. du Sud*, Commune Aquin, nr. Miragoâne (CM 37875, MCZ 66349); 6 mi. (12.6 km) from Miragoâne (MCZ 25555); Butète, nr. Miragoâne (MCZ 66350); Mingrette, nr. Miragoâne (MCZ 66352).

Uromacer catesbyi insulaevaccarum,¹
new subspecies

Holotype: CM 45875, an adult female, western end, Ile-à-Vache, Dépt. du Sud, Haiti, one of a series collected by native collector on 4 August 1962. Original number ASFS X3539.

Paratypes: ASFS X3381-87, ASFS X3537-38, ASFS X3540-46, same data as holotype; AMNH 103215-24, CM 45877-86, MCZ 92076-85, USNM 165937-48, same locality as holotype, native collectors, 6 August 1962.

Definition: A subspecies of *U. catesbyi* characterized by the combination of low number of ventral scales (162 to 173 in males, 159 to 172 in females), moderate to high number of subcaudal scales (180 to 204 in males, 172 to 200 in females), a pale greenish lateral longitudinal line on scale row 2, occasionally involving a portion of scale row 3, upper surface of head immaculate green, and moderate size.

Distribution: Ile-à-Vache, off the southwestern coast of the Tiburon Peninsula, Haiti (Figure 1).

Description of holotype: An adult female with the following scale counts: ventrals 169, subcaudals 196, supralabials 8/8, infralabials 10/10, loreals 1/1, preoculars 1/2,

postoculars 2/2, temporals 1 + 2/1 + 2; dorsal scale row formula 19-17-11; snout-vent length 712 mm, tail 595 mm.

In life, dorsum green (Pl. 22 L 4), with a pale greenish and faint longitudinal line on scale row 2; venter pale yellow-green with a faint yellow line below the dark green mask-like line; iris golden above, black anteriorly and posteriorly, and dark brown below.

Variation: The series of 25 male and 34 female *U. c. insulaevaccarum* has the following counts (extremes and means): ventral scales in males 162-173 (167.0), in females 159-172 (166.3); subcaudal scales in males 180-204 (192.3), in females 172-200 (184.9); supralabials usually 8/8 (56 snakes) with one snake having 7/8 and two snakes having 9/9, infralabials usually 10/10 (31 snakes) with aberrant counts of 9/10 (2), 10/11 (15), 11/11 (9), and 11/12 (1); loreal scales 1/1 (AMNH 103215 with 0/0; AMNH 103222 with 0/1), preocular scales 1/1 (holotype and USNM 165946 with 1/2), postocular scales 2/2 (AMNH 103220 with 2/3), temporals 1 + 2/1 + 2 (ASFS X3386 with 2 + 2 bilaterally; MCZ 92078, USNM 165946, with 1 + 1 unilaterally); largest female (AMNH 103219) with snout-vent length of 800 mm, largest male (ASFS X3616) 615 mm.

All specimens collected by myself and parties in Ile-à-Vache agree with the definition of the subspecies as far as color and pattern are concerned. One individual had the lateral longitudinal line pale blue like nominate *catesbyi* rather than pale green. The dorsal coloration in the series varied from the dark green of the holotype (Pl. 22 L 4) to a paler hue (Pl. 21 J 5).

Remarks: *U. c. insulaevaccarum* occupies Ile-à-Vache, an island separated from the southern coast of the Tiburon Peninsula of Haiti by a channel 10 kilometers in width. The Ile-à-Vache fauna has several endemic subspecies of reptiles (*Diploglossus costatus nesobous*, *Anolis distichus juliae*, *Anolis coelestinus pecunarius*, *Ameiva taeniura aequorea*, *Dromicus parvifrons rosamondae*), but other reptiles and one amphibian (*Eleutherodactylus pictissimus*, *Diploglossus stenurus*, *Leiocephalus melanochlorus*) whose variation has been studied in detail, do not show any local differentiation. Perhaps the latter group

¹From *insula* (island) and *vacca* (cow), an allusion to the distribution of the subspecies, Ile-à-Vache.

Table 1. Meristic and pattern data for eight subspecies of *Uromacer catesbyi*.

Subspecies	Number	Ventrals	Subcaudals	Ventrals + subcaudals	Largest (snout- vent length in mm)	Lateral line	Head pattern
<i>catesbyi</i>	18 ♂	164.8(161-169)	194.6(188-201)	359.6(349-370)	685	Pale blue	None
	29 ♀	163.2(156-172)	182.1(173-190)	344.5(336-354)	830		
<i>insulaevaccarum</i>	25 ♂	167.0(162-173)	192.3(180-204)	359.5(341-375)	615	Pale greenish	None
	34 ♀	166.3(159-172)	184.9(172-200)	351.4(339-365)	800		
<i>cereolineatus</i>	6 ♂	166.0(162-170)	—	—	640	White	None
	3 ♀	165.7(160-169)	181.0(177-185)	345.0(337-353)	410		
<i>lunulatus</i>	16 ♂	171.6(162-177)	191.6(183-203)	364.3(356-375)	645	None	None
	10 ♀	171.4(167-176)	183.8(177-194)	353.0(348-361)	790		
<i>paupineus</i>	13 ♂	167.4(161-174)	179.8(172-189)	347.1(338-358)	610	None	None
	17 ♀	166.8(163-171)	171.1(162-183)	338.2(332-347)	770		
<i>frondicolor</i>	11 ♂	170.4(167-175)	197.0(192-208)	376.6(358-383)	688	None	None
	8 ♀	168.0(165-171)	177.5(175-180)	345	755		
<i>scandax</i>	1 ♂	172	—	—	540	None	Present
	2 ♀	175.5(172-179)	187	360	525		
<i>inchanstegii</i>	6 ♂	163.3(160-167)	174.3(172-176)	338.7(332-343)	590	None	Present
	17 ♀	163.7(160-168)	167.6(159-186)	331.4(319-350)	795		

represents more recent arrivals than does the former.

In addition to the specimens herein designated paratypes, there is a long series of *U. catesbyi* in the collection of the Museum of Comparative Zoology. Most of our snakes were collected by natives; one was secured in my presence by a boy who took the snake from the crown of a coconut palm with a sloping trunk, which the snake had just ascended with great rapidity.

Uromacer catesbyi cereolineatus,²
new subspecies

Holotype: MCZ 92074, an adult male, vicinity of Pointe Sable, Ile Grande Cayemite, Dépt. du Sud, Haiti, one of a series collected by native collectors on 18 March 1966. Original number ASFS V9563.

Paratypes: ASFS V9561-62, ASFS V9564-66, CM 45887-88, same data as holotype.

Associated specimen: Haiti, Dépt. du Sud, Ile Petite Cayemite, 1 (USNM 80825).

Definition: A subspecies of *U. catesbyi* characterized by the combination of low number of ventral scales (162 to 170 in males, 160 to 169 in females), high number of subcaudal scales (all males with incomplete tails; 177 to 185 in females), a white lateral longitudinal line on scale row 2, and upper surface of head immaculate green.

Distribution: Ile Grande Cayemite (and presumably Ile Petite Cayemite), off the northern shore of the Tiburon Peninsula, Dépt. du Sud, Haiti (Fig. 1).

Description of holotype: An adult male with the following scale counts: ventrals 168, subcaudals 173+ (tail incomplete), supralabials 8/8, infralabials 10/10, loreals 0/0, preoculars 1/1, postoculars 2/2, temporals 1 + 2/1 + 2; dorsal scale row formula 17-17-11; snout-vent length 640 mm, tail 558 mm, incomplete.

In life, dorsum dark green (Pl. 24 H 4), with a prominent white lateral longitudinal line on scale row 2; venter yellow-green; chin and throat very pale green, nearly white; mask-like line bordered above with pale yellow-green. Iris color not noted.

Variation: The series of six male (including one male from Petite Cayemite) and

three female *U. c. cereolineatus* has the following counts (extremes and means): ventral scales in males 162-170 (166.0), in females 160-169 (165.7); total subcaudal scales unknown in males (in three males with nearly complete tails subcaudal counts vary between 173 and 194), in females 177-185 (181.0); supralabials always 8/8, infralabials usually 10/10 (6 snakes) with aberrant counts of 10/11 in two snakes; loreals 1/1 (holotype with 0/0), preocular scales 1/1, postocular scales 2/2 (ASFS V9565 with 1/2), temporals 1 + 2/1 + 2; only female which can be reliably measured (CM 45888) has a snout-vent length of 410 mm, largest male (holotype) 640 mm.

Color in life (Grande Cayemite specimens only; data taken by Richard Thomas) varied from dark to light green (Pl. 24 H 4, Pl. 23 H 2, Pl. 22 I 4), and the lateral longitudinal lines were white in both sexes. In two specimens the white lateral lines faded out on the posterior third of the body, but in other individuals the lines persist to the vent. The venters in the series were pale green to yellow-green, and the chin and throat were very pale green (almost white).

Uromacer catesbyi hariolatus,³
new subspecies

Holotype: USNM 165936, an adult male, 2 mi. (3.2 km) W Trou du Nord, Dépt. du Nord, Haiti, taken by Richard Thomas on 8 April 1966. Original number ASFS V10214.

Paratypes (all from Dépt. du Nord, Haiti): ASFS V10168, 1 mi. (1.6 km) E Terrier Rouge, native collector, 8 April 1966; ASFS V10303, Port Margot, native collector, 10 April 1966; ASFS V10304, 5 mi. (8.0 km) E Limbé, E. Cyphale, 10 April 1966; ASFS V10305, Cap-Haïtien, native collector, 10 April 1966; MCZ 37604, MCZ 37606, Cap-Haïtien, 31 March 1934, *Utowana* expedition.

Associated specimens: Haiti, Dépt. du Nord Ouest, Môle St. Nicholas (MCZ 64797, MCZ 62697); Bombardopolis (MCZ 62694-96); Dépt. de l'Artibonite, St. Marc (AMNH 49767); Hinche (MCZ 25553-54); Dépt. de l'Ouest, Mirebalais (MCZ

² From *cereus* (waxen) and *linea* (a thread), an allusion to the white lateral longitudinal line.

³ From *harolior* (to predict), an allusion to the expected occurrence of a north island subspecies.

68534); Duvier, nr. Mirebalais (not mapped) (MCZ 68538); Lancironelle, nr. Mirebalais (not mapped) (MCZ 68536-37); Ledie, nr. Mirebalais (not mapped) (MCZ 68543); Fer-à-cheval, nr. Mirebalais (MCZ 68535); Boucan, nr. Mirebalais (not mapped) (MCZ 68539-42); 2.1 mi. (1.9 km) NE Barrage de Peligre (ASFS X2214).

Definition: A subspecies of *U. catesbyi* characterized by a combination of high to very high number of ventral scales (162 to 177 in males, 167 to 176 in females), moderate to high number of subcaudal scales (183 to 203 in males, 177 to 194 in females), no pale lateral longitudinal line but lower sides grading gradually (on the first three scale rows) from yellowish green venter to dark green dorsum, upper surface of head immaculate green, and moderate size.

Distribution: Haiti, north of the Cul de Sac Plain; intergradient specimens (*catesbyi* × *bariolatus*) from the vicinity of Port-au-Prince and the extreme western Cul de Sac (Figure 1).

Description of holotype: An adult male with the following scale counts: ventrals 177, subcaudals 183, supralabials 8 8, infralabials 10/10, loreals 1 1, preoculars 1/1, postoculars 2/2, temporals 1 + 2/1 + 2; dorsal scale row formula 17-17-11; snout-vent length 610 mm, tail 475 mm.

In life, dorsum dark green, venter yellowish green, the ventral color grading gradually on the lowermost three scale rows into the dorsal color, without the interposition of a pale longitudinal lateral line; chin, throat, and supralabials pale yellowish green; mask-like line bordered above by pale yellowish green. Iris color not noted.

Variation: The series of 16 male and 10 female *U. c. bariolatus* has the following counts (extremes and means): ventral scales in males 162-177 (171.6), in females 167-176 (171.4); subcaudal scales in males 183-203 (191.6), in females 177-194 (183.8); supralabials usually 8 8 (23 snakes) with variation of 7/7 (1), and 7/8 (1), and 8 9 (1); infralabials usually 10/10 (24 snakes) with aberrant counts of 9 10 (1) and 10/11 (1); loreal and preocular scales 1 1 in all specimens, postocular scales 2/2 (ASFS X2214 with 2/4, ASFS V10305 with 2/3), temporals 1 + 2/1 + 2 (MCZ 62697 and ASFS V10168 with 1 + 1 unilaterally; MCZ 68538 with 1 + 1 bilaterally); largest female

(MCZ 68539) with snout-vent length of 790 mm, largest male (MCZ 68538) 645 mm.

All specimens were presumably some shade of green in life. The snake from Terrier Rouge was recorded as having the dorsum Pl. 29 A 10 and the venter Pl. 17 C 8 in life, whereas the Port Margot snake had the dorsum about Pl. 21 I 10. The lateral scale rows (1-3) were paler than the balance of the dorsum, and showed a gradation between the ventral color and that of the back. One snake (MCZ 64797) from Môle St. Nicholas on Haiti's Presqu'île du Nord-Ouest, is unique among the *bariolatus* series in that the lower sides are sharply demarcated from the dorsum (but there is of course no longitudinal lateral line). This style of sharply contrasting lower sides agrees better with Dominican *U. catesbyi* (see discussion following) rather than with other *bariolatus*. Three other specimens from the Presqu'île du Nord-Ouest (Môle St. Nicholas and Bombardopolis) are typical *bariolatus* in this feature, however.

Uromacer catesbyi **pampineus**,¹
new subspecies

Holotype: MCZ 92075, an adult female, 2.1 mi (3.4 km) N Hato Mayor, El Seibo Province, República Dominicana, taken by Ronald F. Klinikowski on 18 June 1963. Original number ASFS X7875.

Paratypes (all from the República Dominicana): ASFS V637, 3 km NE Centro de Boyá, San Cristóbal Province, R. Thomas, 22 August 1963; ASFS V1118-19, 2.5 km NW Boca de Yuma, La Altagracia Province, native collector, 4 September 1963; MCZ 16323-24, La Romana, La Romana Province, E. Liéder, 1922; ASFS V2469-70, 5.1 km E. Santo Domingo, Distrito Nacional, D. C. Leber, R. Thomas, 19 June 1964; MCZ 79297-60, Central Ozama, Distrito Nacional, J. D. Lazell, Jr., 29 December 1963; MCZ 57987, Santo Domingo zoo, Distrito Nacional, J. A. Rivero, 29 March 1953.

Associated specimens: República Dominicana, Monte Cristi Province, 2 km NE Palo Verde, 5 (ASFS V1320-24); 1 km S Palo Verde, 1 (ASFS V1351); Laguna de Salodillo, 7 km SE Pepillo Salcedo, 2 (ASFS

¹ From *pampineus* (pertaining to vine tendrils or leaves), an allusion to the green coloration.

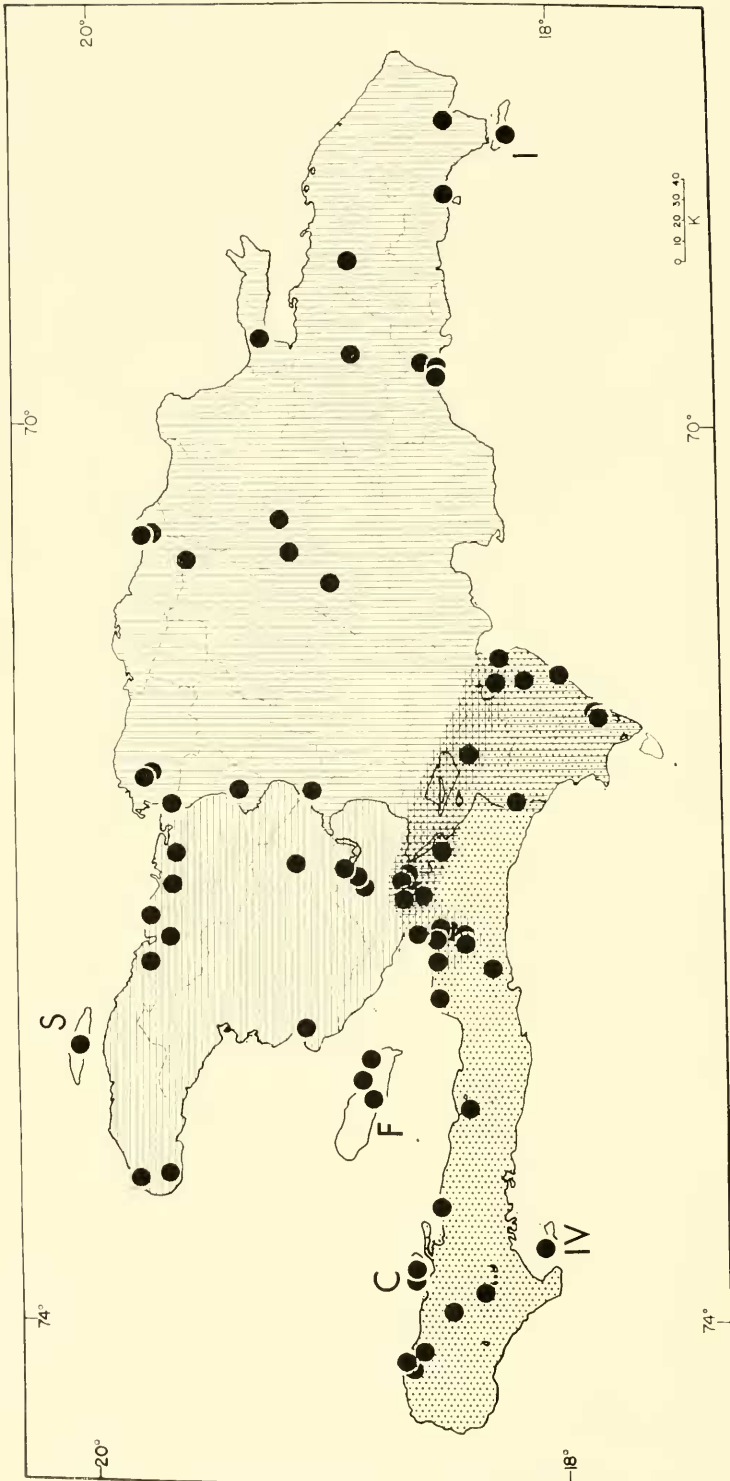


Figure 1. Map of Hispaniola, showing localities whence specimens of *Uromiocr catesbiji* have been examined and the ranges of the subspecies, as follows: *catesbiji*, stippling; *hartiolatus*, horizontal lines; *pampinicus*, vertical lines; *insularaccarum*, IV; *ecreolincatus*, C; *froudicolor*, F; *scandax*, S; *inchausteguii*, I. Area of intergradation between *catesbiji*, *hartiolatus*, and *pampinicus* in the Cul de Sac-Valle de Neiba plain and on the Peninsula de Barahona indicated by overlap of symbols for these three subspecies. The boundary between *hartiolatus* and *pampinicus* along the Dominican-Haitian border is tentative. Large areas, from which no material is available, have been shaded presumptively.

V1458, ASFS V1423); *Dajabón Province*, 1 km S Loma de Cabrera, 900 feet (275 meters), 1 (ASFS V1173); *Puerto Plata Province*, Sosúa, 1 (MCZ 43662); Chocó, 1 (MCZ 13676); 8 km N Pena, 1 (MCZ 57763); *Samaná Province*, Sánchez, 1 (CM 8099); *La Vega Province*, 1 mi. (1.6 km) WSW Constanza, 4000 feet (1220 meters), 1 (ASFS X8731); 12 km NE Jarabacoa, 2000 feet (610 meters), 2 (ASFS V1949, ASFS V14152); 14.4 km E La Vega, 1 (ASFS V4214); *La Estrelleta Province*, Cerro de San Francisco, 3 km E Bánica, 1 (MCZ 57767).

Definition: A subspecies of *U. catesbyi* characterized by the combination of moderate to high number of ventral scales (161 to 174 in males, 163 to 171 in females), low number of subcaudal scales (172 to 189 in males, 162 to 183 in females), no pale lateral longitudinal line but lower sides blue-green to yellow-green on lowermost three scale rows, changing abruptly to green of dorsum, upper surfaces of head immaculate green, and small size.

Distribution: The República Dominicana north of the Valle de Neiba (Figure 1).

Description of holotype: An adult female with the following scale counts: ventrals 164, subcaudals 168 (tail slightly incomplete), supralabials 8/8, infralabials 10/10, loreals 1/1, preoculars 1/1, postoculars 2/2, temporals 1 + 1/1 + 2; dorsal scale row formula 17-17-11; snout-vent length 722 mm, tail 529 mm.

In life, dorsum green (Pl. 29 F 11); first two scale rows, plus half of third scale row, pale blue-green (Pl. 25 B 7); venter and supralabials pale green (Pl. 17 H 8); mask-like line dark green, bordered above by faintly paler green. Iris golden brown above, brown below.

Variation: The series of 13 male and 17 female *U. c. pampineus* has the following counts (extremes and means): ventral scales in males 161-174 (167.4), in females 163-171 (166.8); subcaudal scales in males 172-189 (179.8), in females 162-183 (171.1); supralabials usually 8/8 (29 snakes) with one snake having 7/8, infralabials usually 10/10 (25 snakes) with aberrant counts of 9/9 (1), and 10/11 (3); loreal scales 1/1 (MCZ 79260 with 0/1), preocular scales 1/1 (ASFS V1118 with 2/1, ASFS V4214 with 2/2), postocular scales 2/2 (ASFS

V1173 with 1/2), temporals 1 + 2/1 + 2 (holotype and ASFS V1458 with 1 + 1 unilaterally, MCZ 79257 with 1 + 1 bilaterally, ASFS V637 with 1 + 3 unilaterally); largest female (CM 8099) with snout-vent length of 770 mm, largest male (ASFS V1321) 610 mm.

All specimens were green in life; a female from near Jarabacoa was recorded as being Pl. 19 D 9 above. The venters were uniformly a paler yellow-green (recorded as Pl. 25 A 7 in the Jarabacoa snake); the paler coloration extended onto the lowermost two or three dorsal scale rows as a distinct longitudinal pale area. In some individuals, such as the holotype, the lower sides were pale blue-green, in contrast to both the yellowish venter and the more pure green dorsum. In preserved specimens the lower sides are sharply bicolor in many well-preserved snakes; in other individuals longer preserved or discolored, the bicolor condition of the sides is no longer discernible.

Remarks: No certain intergrades between *bariolatus* and *pampineus* are known from along Dominico-Haitian border. Specimens from localities near this border (Monte Cristi, Dajabón, and La Estrelleta provinces) include snakes which have low subcaudal counts. A male from Monte Cristi (ASFS V1320) has a subcaudal count of 189, the upper extreme of male *pampineus*; the total underbody scales (ventrals subcaudals) of this snake are 357, at the point of overlap of this count between *pampineus* and *bariolatus*. Perhaps the Pepillo Salcedo region is one of extreme intergradation between *pampineus* and *bariolatus*, with the population more closely resembling the Dominican snakes than the Haitian. The snake with the highest female subcaudal count is from La Estrelleta Province; this snake has 183 subcaudals and a total underbody count of 347, the upper extreme of *pampineus* females. It too probably shows the genetic influence of *bariolatus* upon a predominantly *pampineus* population, although with but a single specimen details are lacking.

U. c. pampineus is widespread throughout the República Dominicana and occurs from sea level to elevations of at least 4000 feet (1220 meters) in the Valle de Constanza in the Cordillera Central. The holotype was collected in a *Theobroma* grove, and one snake from near Jarabacoa was collected as

it climbed about the lower branches of a deciduous tree in what is essentially upland (610 meters) pine woods. The specimen from Centro de Boyá was taken as it crawled across a termitarium 4.5 meters above the ground, and the long series from Palo Verde was collected on a barbedwire fence adjacent to anole-rich lowland woods.

Uromacer catesbyi frondicolor,⁵
new subspecies

Holotype: MCZ 93162, an adult male, Degoute, Ile de la Gonáve, Haiti, one of a series collected by George Whiteman in December 1965.

Paratypes (all from Ile de la Gonáve): MCZ 93163-65, same data as holotype; ASFS X2431-32, Etroits, E. Cyphale, 17 July 1962; ASFS X3322, Etroits, E. Cyphale, 26 July 1962; USNM 75926, Anse à Galets, J. S. C. Boswell, 21 September 1928; MCZ 93171, Platon Yeyé (not mapped), G. Whiteman, December 1965; MCZ 93138, Boisederet (not mapped), G. Whiteman, December 1965; MCZ 93167-70, Ravine Fogue (not mapped), G. Whiteman, December 1965; MCZ 93172-73, Bois Boule (not mapped), G. Whiteman, December 1965; MCZ 80830-31, Ti Palmiste, 6 km from Pointe-à-Raquettes, G. Whiteman, summer 1964; USNM 63115, "Gonave Island," W. L. Abbott, 16 March 1920; MCZ 12869, "La Gonáve," G. M. Allen, 1918.

Definition: A subspecies of *U. catesbyi* characterized by a combination of moderate to high number of ventral scales (167 to 175 in males, 165 to 171 in females), (moderate ? to) very high number of subcaudal scales (192 to 208 in males, 175 and 180 in two females), no pale lateral longitudinal line, the lower sides grading gradually (on the first three scale rows) from the light green venter to the dark green dorsum, upper surfaces of head immaculate green, and moderate size.

Distribution: Ile de la Gonáve, Haiti.

Description of holotype: An adult male with the following scale counts: ventrals 171, subcaudals 193, supralabials 8 8, infralabials 10/10, loreals 1/1, preoculars 1/1, postoculars 2/2, temporals 1 + 1/1 + 3; dor-

sal scale row formula 18-17-11; snout-vent length 688, tail length indeterminate because of damaged tail.

Preserved, the holotype is blue-green above, slightly paler below. The supralabials are concolor with the venter, and the black mask-like line is prominent and bordered above on the temporal region by pale bluish green. Iris color indeterminable.

Variation: The series of 11 male and 8 female *U. c. frondicolor* has the following counts (extremes and means): ventral scales in males 167-175 (170.4), in females 165-171 (168.0); subcaudal scales in males 192-208 (197.0), in two females with complete tails 175-180 (177.5); supralabials 8/8 in all specimens, infralabials usually 10/10 (11 snakes) with aberrant counts of 9/10 (3), 10/11 (3), 11/11 (2) and 11/12 (1); loreal scales 1/1, preocular scales usually 1/1 (MCZ 93168 and MCZ 93165 with 1/2), postoculars 2/2 (MCZ 93138 with 1/2), temporals 1 + 2/1 + 2 (ASFS X3432, MCZ 12869, MCZ 93138 with 1 + 1 unilaterally; MCZ 93170 with 1 + 1 bilaterally; holotype with 1 + 1/1 + 3); largest female (MCZ 80830) with snout-vent length of 755 mm, largest male (holotype) 688 mm.

The color of the three *U. c. frondicolor* seen in life was recorded as light green below and dark green above, and there was no blue lateral line. The remaining paratypes have been preserved for various periods, and little can be said about the coloration and pattern in life of this subspecies.

Remarks: The relatively few specimens of *U. c. frondicolor* available suggest that the species is uncommon on Ile de la Gonáve. One of the specimens from Etroits was taken by natives in a lime grove. Since so few of the localities for *U. c. frondicolor* are precisely locatable, the altitudinal distribution of the subspecies is unknown; however, Etroits is on the coast in an extremely xeric situation and Ti Palmiste lies inland at an elevation of about 400 meters.

Uromacer catesbyi scandax Dunn, 1920

Definition: A subspecies of *U. catesbyi* characterized by a combination of high to very high number of ventral scales (172 in single male, 172 to 179 in two females), high (?) number of subcaudal scales (187 in female with complete tail), no pale lateral

⁵ From *frons* (leaf) and *color* (color), an allusion to the green color.

longitudinal line and, apparently, lower sides not set off chromatically from the upper dorsum, and upper surface of head with scattered darker areas (in life green?) on a paler ground at least in juveniles.

Distribution: Ile de la Tortue, off the northern Haitian coast (Figure 1).

Variation: A single male *U. c. scandax* has 172 ventrals, subcaudals indeterminate, 8/8 supralabials, 10/10 infralabials, 1/1 loreals, 1/1 preoculars, 2/2 postoculars, 1+2/1+2 temporals, dorsal scale row formula 19-17-11, snout-vent length 540 mm; two females have 172 and 179 ventrals (mean 175.5), 187 subcaudals in one specimen, 8/8 supralabials, 10/10 infralabials, 1/1 loreals, 1/1 preoculars, 2/2 postoculars, 1+2/1+2 temporals, 19-17-11 and 17-17-11 dorsal scale rows; one female has a snout-vent length of 525 mm and a tail length of 410 mm.

The status of the Tortue population of *U. catesbyi* remains equivocal. Dunn (1920) described *U. scandax* from a single female from "Tortuga Island," and Cochran (1941: 334) accepted this form as a species distinct from *U. catesbyi*. Cochran also (*op. cit.*: 332-333) considered two other specimens from Tortue as *U. catesbyi*, thereby implying that two short-snouted species of *Uromacer* occurred on that island. Mertens (1939:78), however, considered *scandax* only subspecifically related to *U. catesbyi*. I have studied the three specimens available to Cochran and can see no reason either to consider *scandax* a species distinct from *catesbyi* or to exclude the two other Tortue specimens from *scandax*. These three specimens, considered together, seem to indicate that *scandax* is a moderately well defined subspecies of *U. catesbyi*. Lack of an adequate series makes meristic comparisons of *scandax* with other *U. catesbyi* subspecies difficult. However, the ventral counts of two female *scandax* (172 and 179) are at the upper limit of ventral counts for the species (155 to 179), and the count for the single male (172) is high in the total range of this count in male *U. catesbyi* (157-177). Except for the high ventral counts in female *scandax*, the next highest counts occur in female *U. c. hario-latus*, which occurs on the adjacent mainland of Haiti.

The two smaller specimens of *U. c. scandax*

(USNM 59920, MCZ 37607) are peculiar in that they are now a dull grayish green dorsally and are heavily stippled with dark gray-green ventrally—a chromatic development not matched by any other specimens of *U. catesbyi*. The adult holotype (USNM 59438) presently is colored like comparably aged specimens. It is likely that fresh specimens of *scandax* will demonstrate chromatic differences, at least in immature specimens, between the Tortue subspecies and those elsewhere.

Specimens examined: Haiti, Ile de la Tortue (USNM 59438—holotype, USNM 59920, MCZ 37607).

Uromacer catesbyi inchausteguii,⁶
new subspecies

Holotype: CM 45876, an adult female, environs of Mano Juan, Isla Saona, República Dominicana, one of a series collected by native collectors on 28 December 1968. Original number ASFS V16157.

Paratypes (all from Isla Saona): ASFS V16158-59, ASFS V16177, same data as holotype; ASFS V3068, same locality as holotype, R. Thomas, 19 July 1964; MCZ 92086-90, same locality as holotype, native collectors, 13 August 1968; AMNH 103225-29, USNM 165950-54, same locality as holotype, native collectors, 14 August 1968; USNM 165949, same locality as holotype, native collector, 29 December 1968; LDO 7-5535, same locality as holotype, native collector, 30 December 1968; ASFS V16321, 2.5 mi. (4.0 km) NW Mano Juan, J. A. Rodgers, Jr., 29 December 1968.

Definition: A subspecies of *U. catesbyi* characterized by the combination of low to very low number of ventral scales (160 to 167 in males, 160 to 168 in females), very low number of subcaudal scales (172 to 176 in males, 159 to 186 in females), no pale lateral longitudinal line, but lower sides (scale rows 1-3) a distinctly paler green than the dorsum, all dorsal scales with a distinct black edging to give a definitely squamate appearance, upper side of head with dark green markings on a paler green ground, and small size.

Distribution: Isla Saona, off the south-

⁶ In honor of Sixto J. Inchaustegui who was responsible for the opportunity to collect most of the specimens of this subspecies.

eastern tip of the Republica Dominicana (Figure 1).

Description of holotype: An adult female with the following scale counts: ventrals 161, subcaudals 163, supralabials 8 8, infra-labials 10 10, loreals 1 1, preoculars 1 1, postoculars 2 3, temporals 1 + 2 1 + 2, dorsal scale row formula 19-17-11; snout-vent length 680 mm, tail 484 mm.

In life, dorsum green, the lowermost three scale rows distinctly paler green than dorsum, a lateral extension of the ventral pale green color; throat and supralabials whitish (very pale green), black mask-like line margined above by very pale green; internasals, prefrontals, supraoculars, and parietals with dark grayish green flecks, dashes, or rectangular figures (on prefrontals), all very conspicuous in life. Iris color unrecorded.

Variation: The series of 6 males and 17 females has the following counts (extremes and means): ventral scales in males 160-167 (163.3), in females 160-168 (163.7); subcaudal scales in males 172-176 (174.3), in females 159-186 (167.6); supralabials 8 8, infra-labials 10 10, with two snakes having 9 10; loreal scales 1 1 (ASFS V14895 with 0 0), preocular scales 1 1, postocular scales 2 2 (holotype and ASFS V14894 with 2 3), temporals 1 + 2 1 + 2; largest female (ASFS V3068) with snout-vent length of 795 mm, largest male (AMNH 103225) 590 mm.

The entire series of *U. c. inchausteguii* agrees with the description of the holotype in having the dorsal scales edged with black, these giving a distinctly squamate appearance to the back, and in having flecks, dashes, or small irregular dark figures on the dorsal head scales. The lower sides (scale rows 1-3) are in life often a paler shade of green, contrasting distinctly with the darker green back, but this feature sometimes is lost after preservation.

Remarks: *U. c. inchausteguii* appears to be fairly common in the environs of the village of Mano Juan. The specimen taken by Rodgers was secured in open broadleaf forest as it crawled on leaf litter. Of the two species of *Uromacer* on Isla Saona, *U. catesbyi* appears to be outnumbered by *U. oxyrhynchus*, since more specimens of the latter species were brought to us by native collectors.

COMPARISONS

Uromacer catesbyi has been shown to be divided into eight subspecies. Three of these subspecies are obviously interrelated more closely than they are to the balance of the subspecies. The subspecies *catesbyi*, *insulaevaccarum*, and *cereolineatus* possess a pale lateral line on scale rows 1 to 3, whereas the remaining five subspecies lack this pattern feature. The three lineate taxa differ from each other in the color of the lateral line (pale blue in *catesbyi*, pale greenish in *insulaevaccarum*, and white in *cereolineatus*). In addition to the differences in lateral line pigmentation, both sexes of *U. c. catesbyi* have lower mean numbers of ventral scales than do both sexes of *insulaevaccarum* (male *catesbyi* 164.8, male *insulaevaccarum* 167.0; female *catesbyi* 163.2, female *insulaevaccarum* 166.3), although the differences are not striking. In subcaudal scale counts, the situation is anomalous, since male *insulaevaccarum* have a lower mean (192.3) than do male *catesbyi* (194.6), and female *insulaevaccarum* have a much higher mean (192.3) than do female *catesbyi* (182.1). These two subspecies reach approximately the same size.

Comparison of *catesbyi* and *insulaevaccarum* with *cereolineatus* is made difficult by the short series of the latter subspecies, and the fact that no male *cereolineatus* have complete tails. There are also no obviously adult female *cereolineatus*, so that size comparisons are not possible. At least male *cereolineatus* resemble male *insulaevaccarum* in maximum known size, rather than there being a resemblance between *cereolineatus* and adjacent *catesbyi* in this feature. Total underbody scale counts (ventrals + subcaudals) of female *cereolineatus* are close, both in means and extremes, to those of *catesbyi* and are lower than those of *insulaevaccarum*.

The remaining five subspecies (*bariolatus*, *pampineus*, *frondicolor*, *scandax*, *inchausteguii*) differ as a group from the western subspecies *catesbyi-insulaevaccarum-cereolineatus* series in lacking a lateral line. *U. c. bariolatus* is characterized by having a gradual change from the ventral coloration to that of the dorsum and in having a higher mean number of ventral scales in both sexes in comparison with all the western subspecies

(mean in male *bariolatus* 171.6, means in males of western subspecies 164.8–167.0; female *bariolatus* 171.4, means in females of western subspecies 163.2–166.3). *U. c. pampineus* resembles *bariolatus* in being all green and without a lateral line, but *bariolatus* lacks the strongly contrasting lower scale rows which *pampineus* possesses. The subcaudal counts of *bariolatus* are consistently higher (183–203 in males, 177–194 in females) than in *pampineus* (172–189 in males, 162–183 in females); the ventral counts of the two subspecies are comparable, with *pampineus* averaging a few less ventrals than *bariolatus*. If total underbody scale counts are used to distinguish the two populations, almost complete separation of individuals of both sexes is achieved (356 to 375 in male *bariolatus*, 338 to 358 in male *pampineus*; 348 to 361 in female *bariolatus*, 332 to 347 in female *pampineus*).

U. c. frondicolor differs from *pampineus* in lacking contrastingly colored lower sides and in having a higher number of subcaudal scales (at least in males; only two female *frondicolor* have complete tails). Male *pampineus*, with subcaudal counts of 172 to 189, are completely separable from male *frondicolor* with subcaudal counts of 192 to 208. Of all the subspecies of *U. catesbyi*, *frondicolor* has the highest counts of subcaudal scales. *U. c. frondicolor* most closely resembles adjacent *U. c. bariolatus* in dorsal and lateral color and pattern. *U. c. frondicolor* averages less ventral scales in both sexes than does *bariolatus* (male *frondicolor* 170.4, male *bariolatus* 171.6; female *frondicolor* 168.0, female *bariolatus* 171.4), although the extremes in male *frondicolor* are embraced by the extremes in male *bariolatus*. The situation in subcaudals is anomalous, since the male *frondicolor* have a higher mean (197.0) than do male *bariolatus* (191.6); the subcaudal counts of the two female *frondicolor* on the other hand lie below and at the lower extreme of subcaudal counts in female *bariolatus*. It seems likely that additional female *frondicolor* will show that, in this sex also, the subcaudal count has both a higher mean and upper extreme than in female *bariolatus*.

The remaining two subspecies, *scandax* and *inchausteguii*, differ from all others in that both have dark cephalic markings; these markings occur apparently only in juveniles

in *scandax* and in all specimens in *inchausteguii*. Although *scandax* is represented by only three specimens, the ventral counts from these three snakes are at the upper extreme (females) or high (male) for the species. On the other hand, *inchausteguii* has the lowest mean number of subcaudal scales and a low mean number of ventral scales. Total underbody scale counts in *inchausteguii* are 332 to 343 in males, 319 to 350 in females. Male *inchausteguii* are completely separable from male *catesbyi*, *frondicolor* and *bariolatus*, when this count is used as an index, and there is very little overlap between *inchausteguii* and male *insulaevaccarum* and *pampineus*. As far as females are concerned, there is little overlap between total underbody counts of *inchausteguii* and *bariolatus* (348–361). The darkly margined scales of *inchausteguii* differentiate that subspecies from all others.

DISCUSSION

Uromacer catesbyi, as defined here, is comprised of eight subspecies, three of which occur on the main island (*catesbyi*, *bariolatus*, *pampineus*) and five on satellite islands (*insulaevaccarum*, *cereolineatus*, *frondicolor*, *scandax*, *inchausteguii*). The distribution of the subspecies in *U. catesbyi* is similar to that of *Dromicus parvifrons* Cope (see Thomas and Schwartz, 1965); in that colubrid snake, nine subspecies are recognized, four of which occur only on the main island, four on the satellites, and one on both a satellite island and the adjacent mainland. Details of subspecific boundaries in *U. catesbyi* and *D. parvifrons* on Hispaniola are not comparable, although a distinct subspecies of each occurs on the Tiburon Peninsula. I have examined only a few specimens of *U. catesbyi* from the Península de Samaná in the northeastern República Dominicana. This peninsula, with its narrow swampy neck, has been a center of differentiation for several species of amphibians and reptiles (*Eleutherodactylus weinlandi*, *Diploglossus stenurus*, *Dromicus parvifrons*); it is possible that still another subspecies of *U. catesbyi* inhabits the Península de Samaná.

No mention has thus far been made of the complexities of the interrelationships between the subspecies *catesbyi*, *bariolatus*, and *pampineus* in, and south of, the Cul de Sac-

Valle de Neiba plain which separates the old north and south (*sensu* Williams, 1961) islands of Hispaniola, and on the Península de Barahona. A discussion of the problems in this region, and the interpretation of these problems is now presented.

The region of intergradation between nominate *catesbyi* and *bariolatus* is in the vicinity of Port-au-Prince and the western extreme of the Cul de Sac Plain in Haiti. Two specimens from Port-au-Prince (MCZ 60154, MCZ 37599), one from Pétienville (MCZ 60162) in the mountains south of Port-au-Prince, and three from Damien in the Cul de Sac north of Port-au-Prince (MCZ 60158-60) have a longitudinal pale lateral line (presumably blue in life) on the lowermost scales rows (scale row 2 in all, expanding to scale row 1 in one snake and to row 3 in two snakes). Other snakes from this general region (Mont Cabaïo, Morne Decayette, Morne l'Hôpital, Delmas, Peneau—a total of 15 additional specimens) at present lack any indication of the lateral line. The snake from Peneau was examined while living and I can verify the absence of the lateral line. Thus, snakes from the area included by Morne Decayette in the west, Damien in the north, Delmas in the east, and Peneau and Mont Cabaïo in the south I regard as intermediate in pattern between *catesbyi* and *bariolatus*. Snakes from the southern versant of the Massif de la Selle in this region (Bascap-Rouge) are typical *U. c. catesbyi* and show no *bariolatus* influence.

The Hispaniolan south island is comprised of both the Tiburon Peninsula in Haiti and the Península de Barahona in the República Dominicana. The north island includes the balance of Hispaniola north of the Cul de Sac-Valle de Neiba plain. In a large number of species of amphibians and reptiles, the south island area is occupied by populations subspecifically distinct from those of the north island.

A reasonable assumption would be that *U. c. catesbyi* is the form occurring on the Península de Barahona, but such does not seem to be the case. A series of 12 snakes from various Barahona localities, including the city of Barahona itself and its immediate environs, as well as localities (Oviedo, Pederuales) well south on the peninsula, is available; none of these snakes has the distinctive

U. c. catesbyi lateral line. Two of the specimens were collected by myself and parties, and neither was recorded as having a pale lateral line; the balance of the Barahona material is from other collections and color and pattern data are not available. Thus I interpret the absence of the lateral line in all specimens from this region as a constant Barahona feature. The means of ventral scales in the Barahona snakes (164.5 in males, 164.4 in females) are quite comparable to similar means (164.8 and 164.4, respectively) in *catesbyi*. There are no Barahona males with complete tails, but the female subcaudal mean (179.0) is similar to that in female *catesbyi* (182.1). The largest female *U. catesbyi* examined (MCZ 57765), with a snout-vent length of 908 mm, is from the Península de Barahona; *U. c. catesbyi* is a large snake, although the largest Tiburon female has a snout-vent length of 830 mm.

The Cul de Sac-Valle de Neiba plain presently connects the previous Hispaniolan north and south islands. If this plain (in places lower than sea level) was at times a strait separating the two islands and was recolonized after its emergence, it seems reasonable that the *U. catesbyi* populations in the plain would show a mixture of characteristics of the subspecies to the north and the south. I have pointed out above that *bariolatus* and *catesbyi* intergrade in the extreme western portion of the Cul de Sac. There is a series of 15 snakes from the balance of the plain (localities from Eaux Gaillées in Haiti to Cabral in the República Dominicana, five of which were collected by Richard Thomas); none of these shows any trace of a lateral pale stripe, nor any tendencies toward the nominate subspecies. Nine males have a ventral mean of 166.5—intermediate between the mean ventral count of *catesbyi* + Barahona males on one hand, and *bariolatus* on the other. Six females from this region have a ventral count mean of 166.8, again intermediate between the same two samples. The subcaudal mean (186.8) of six males, however, is much lower than that of ten *catesbyi* males (194.6), although the extremes overlap very broadly; four females from the Cul de Sac-Valle de Neiba have a subcaudal mean (182.8) almost identical with that of 11 female *catesbyi* (182.1).

Specimens of *U. catesbyi* from Haiti (*bari-*

olatus) differ from those from the República Dominicana (*pampineus*) in number of subcaudal scales, the Dominican snakes with much lower ranges and means. It is possible that *pampineus* (with lower number of subcaudals) has influenced the Cul de Sac-Valle de Neiba snakes to some extent, thereby accounting for the low number of subcaudals in males from the Cul de Sac-Valle de Neiba.

I interpret the Cul de Sac-Valle de Neiba snakes as intermediate between *catesbyi* (whose influence is most clearly shown in the laterally striped pattern at the extreme western end of the Cul de Sac), *bariolatus* (whose influence is most clearly shown in the basic dorsal color and absence of a longitudinal line in the greater portion of the sample), and *pampineus* which has contributed toward the lower number of subcaudal scales.

The Barahona population is peculiar. In color and pattern it agrees with *pampineus* north of the Valle de Neiba, rather than with *catesbyi* to the west; in ventrals, the Barahona snakes are like *catesbyi* rather than *pampineus*, and in subcaudals they are like *bariolatus* (and intergradient specimens from the Cul de Sac-Valle de Neiba). Although there might be justification in the future for considering the Península de Barahona populations as a subspecies distinct from all others, it seems prudent at this time to regard them as extreme intergrades between *catesbyi* and *pampineus*.

The above discussion is based upon the following suite of specimens, grouped according to the areas mentioned:

I. Port-au-Prince and vicinity (*catesbyi* × *bariolatus*): *Haiti, Dépt. de l'Ouest*, Port-au-Prince (MCZ 60149-50, MCZ 60152-57, MCZ 37599); Morne Decayette (MCZ 62698); Source Leclerc, Morne Decayette (MCZ 65969); Delmas (MCZ 65970-71); Damien (MCZ 61058-61); Source Bariajoux, Morne l'Hôpital (not mapped) (MCZ 65972); Pétionville (MCZ 60162); Furcy, Mont Cabaïo (MCZ 45743); Peneau, 5000 feet (1525 meters) (ASFS X1572).

II. Cul de Sac-Valle de Neiba (*catesbyi* × *bariolatus* × *pampineus*): *Haiti, Dépt. de l'Ouest*, 13.1 km E Croix des Bouquets (ASFS V8144, ASFS V8345, ASFS V8307); Eaux Gaillées (MCZ 60168-70); Thomazeau

(MCZ 12864-65); Tête Source, 1.4 mi. (2.2 km) NNE Thomazeau (ASFS V8197); between Thomazeau and Gloré (MCZ 60171); Manneville (MCZ 8747); La Source, E of Fond Parisien (ASFS V8134); *República Dominicana, Independencia Prov.*, Duvergé (AMNH 40993-94); *Barahona Prov.*, woods at Cabral (AMNH 52397).

III. Península de Barahona (*catesbyi* × *pampineus*): *República Dominicana, Barahona Prov.*, Barahona (MCZ 43804-05); Palomino Springs, nr. Barahona (not mapped) (AMNH 59750); Valle de Polo (AMNH 51426-27, AMNH 51422); Hermann's finca, nr. Paraíso (AMNH 51424); 3.5 mi. (5.6 km) from Paraíso (AMNH 51428); *Pedernales Prov.*, 13.1 mi. (21.0 km) SW Enriquillo (ASFS V4425); Oviedo (MCZ 57765-66); 19 km N Pedernales, 1000 feet (305 meters) (ASFS V2697).

Horn (1969) proposed an hypothetical history of the genus *Uromacer* which he considered to be composed of four species. *Uromacer catesbyi* he regarded as the most primitive of the species, since it is the least specialized morphologically (all other species are long-snouted, attenuate snakes) and has a dietary repertory which is composed of arboreal animals. (Presumably arboreality is the original niche for the genus, from which situation the remaining species have become more terrestrial.) Horn further suggested that an ancestral colubrid (perhaps an unspecialized *Alsophis*-type snake) gave rise to both a proto-*catesbyi* and a proto-*frenatus* (the latter one of the long-snouted taxa), which were, respectively, the *Uromacer* of the north and south Hispaniolan islands. Although this is a possibility, the taxonomic status of the long-snouted forms precludes any more definitive statement of the early history of the genus. Whatever the early division of the genus, surely there was a basic division into short- and long-snouted forms, but I remain unconvinced that proto-*catesbyi* is the north island analogue of south island proto-*frenatus*. It seems likely to me that, early in the history of proto-*catesbyi*, this group of snakes invaded the south island from the north island, and that the presence of a lineate lateral pattern in the Tiburon-Vache-Cayemites subspecies represents one old line of evolution from proto-*catesbyi* and the non-lineate subspecies represent the

other. Although it is customary to consider that loss of a character is the more advanced condition (and thus the Tiburon-Vache-Cayemites subspecies would represent the primitive forms since they possess a pale lateral line), the non-lineate subspecies occupy a much greater area and the absence of a lateral line would seem in this case to be the primitive rather than the advanced condition.

Whatever the details, it seems certain that *U. catesbyi* was early split into two stocks, corresponding to the old north and south islands of Hispaniola. One of these (that on the south island) had a pale lateral longitudinal line (*catesbyi*) and from this stock arose *insulaevaccarum* and *cereolineatus*. Both subspecies retain the lineate lateral pattern but have diverged in the color of the lateral line (from blue to pale green or white). The north island stock, separated from its relatives on the south island by the then submerged Cul de Sac-Valle de Neiba plain, lacked a lateral longitudinal pale line but maintained a more or less uniform dorsal color (although the lower sides may be lighter in contrast to the more dorsal coloration).

With the elevation of the interisland strait, the south island *catesbyi* and the north island *bariolatus* and *pampineus* once more came into contact and intergraded with one another. Intergradation is evident in the western Cul de Sac, where some snakes retain the blue lateral line of *catesbyi* and some do not. In the rest of the Cul de Sac-Valle de Neiba plain, the snakes present a mixture of scutellar characteristics derived from *catesbyi*, *bariolatus*, and *pampineus*. The most unusual situation is that on the Peninsula de Barahona, where the snakes seem to represent intergrades between *catesbyi* and *pampineus*; typical blue-lined *catesbyi* occur no closer to the República Dominicana in the region of the Peninsula de Barahona than Bascap-Rouge on the southern slope of the Massif de la Selle in Haiti. Although the Barahona situation is not clear, it is possible that northern *pampineus* and southern *catesbyi* were long in contact in the Barahona region (this contact possibly of longer duration than the final, complete closure of the interisland strait) with consequently greater opportunity for genetic mixing. There remains

the possibility that, as in the case of the subspecies of *Dromicus parvifrons* (Thomas and Schwartz, 1965:69-70), the Peninsula de Barahona populations of *U. catesbyi* show influence from an as yet undiscovered Isla Beara population, if it in fact exists.

The two north island subspecies *bariolatus* and *pampineus* present a puzzle. I cannot arrive at any reason for the two subspecies to meet at approximately the Dominico-Haitian border as they appear to do. Along this border there is a more or less continuous montane barrier (Montagnes du Trou d'Eau-Sierra de Neiba; Massif du Nord-Cordillera Central); these ranges lie at right angles to the international boundary and intermontane valleys should afford easy access between the two subspecies. Additionally, *U. catesbyi* occurs at high elevations, and mountains should not be effective barriers to these snakes.

Two of the satellite subspecies, *scandax* and *inchausteguii*, differ from all other populations in having a patterned head (apparently only in juvenile *scandax*). The islands inhabited by these subspecies, Tortue and Saona, lie diametrically opposed to Hispaniola proper, one at the northwest (Tortue), the other at the southeast (Saona). That such a pigmental trait occurs in two widely separated populations of *U. catesbyi* is perplexing. A comparable situation is the basically black ground color of all the satellite populations of *Dromicus parvifrons*, in contrast to most of the mainland snakes.

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